2003 MOURNING DOVE
POPULATION AND RESEARCH
STATUS REPORT

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2002 MOURNING DOVE HARVESTS

Preliminary harvest data for 2002 show 38,531 mourning dove hunters harvested 685,176 doves statewide; a 8.1% decrease in harvest from 2001. The estimated 2002 dove harvest decreased 6.9% from the 5-year average (1997-01) (735,654 average harvest; SD 30,296) and decreased 13.7% from the 10-year average (1992-01) (793,519 average harvest; SD 81,454). Dove hunters averaged 4.0 doves per day and 4.4 days of hunting per season in 2002 compared to 4.5 doves per day and 4.0 days per season in 2001. Average season bag for 2002 was 17.8 mourning doves; almost no change compared to 2001. Regional data for 2002 showed Northeastern Riverbreaks and Mississippi Lowlands with the highest harvests (168,297 and 146,918 doves respectively) and Ozark Plateau the lowest (40,541 doves; Fig. 1).

Long-term mourning dove harvest trends and number of dove hunters continue to show declines (Fig. 2), with daily bag and average days afield remaining relatively stable or slightly increasing (Fig. 3). Although the number of hunters and harvested doves has declined since the 1970s, remaining dove hunters are hunting about the same number days, while gradually increasing their daily harvest.

SEASON FORMAT CONTINUES

Missouri will continue a 70-day season and 12-bird bag limit this fall. Following is background information explaining how we arrived at this format.

Prior to 1990, Missouri opted for a 70-day season and 10-bird bag limit. The reason for the voluntary bag limit reduction from 12 to 10 doves was to express concern to the U.S. Fish and Wildlife Service (USFWS) and other states in the Central Management Unit (CMU; Fig. 4) over long-term population trend declines. In 1990, however, we took advantage of the actual allotted 12-bird bag limit that corresponded with the 70-day season provided by the federal frameworks. With this increase in bag limit, we could still hunt doves the first 10-days of November. In 1992, however, Missouri chose the 15-bird bag limit which required a 60-day season format. This decision eliminated late season mourning dove hunting opportunities for approximately 75,000 to 80,000 quail and pheasant hunters in early November. After the 1992 regulation change the Department received numerous comments and suggestions concerning lost dove hunting opportunities during the first 10-days of November. Based on those concerns, a split season was established during 1999 and 2000 to provide dove hunting opportunity over a longer time period.

Prior to the split season format, field staff reported that they knew of few, if any, hunters that hunted doves during October. After the 1999 split dove season, however, the Department received several calls and letters from hunters that had become accustomed to dove hunting in October. Data were gathered from various sources to learn more about impacts of the split season. Results showed that the vast majority of dove hunters (76%) and conservation agents (66%) wanted to return to a continuous season format. Although a majority of hunters (53%) and conservation agents (51%) wanted to retain the 15-bird limit and 60-day season, data from managed dove shooting areas showed that most hunters seldom shoot their full bag limit (Fig. 5). Thus, a return to the slightly lower bag limit and slightly longer season was considered the best compromise.

EURASIAN COLLARED-DOVES AND WHITE-WINGED DOVES IN AGGREGATE

For the second year, Missouri dove hunters will be allowed to shoot 12 mourning doves (*Zenaida macroura*), Eurasian collared-doves (*Streptopelia decaocto*), and/or white-winged doves (*Zenaida asiatica*) in aggregate. The primary reason for this change was to provide for the incidental take of these birds during the regular mourning dove hunting season. An early season migratory bird hunting pamphlet has been developed which will assist dove hunters with the identification of these species.

Eurasian collared-doves are a relatively new and exotic species that is spreading across the U.S. from east to west. The bird is native to northern Africa and rapidly colonized Europe during the 1940s and 1950s. The bird was first observed in southern Florida in the mid-1980s, most likely brought ashore during a tropical storm. Currently, the birds appear to have statewide distribution in Missouri. Eurasian collared-doves have a characteristic black ring at the base of the neck or nape, have a broad squared-off tail compared to the narrow and pointed tail of a mourning dove, and are much larger than mourning doves.

In addition, white-winged doves have been expanding their range northward from southern Texas, into Oklahoma, Kansas, Nebraska, and Missouri. White-winged doves are easily distinguished in the field by large white wing patches that are visible either in-flight or on the roost.

MOURNING DOVE POPULATIONS TRENDS/SURVEYS

The Department annually conducts two dove surveys in Missouri, the Mourning Dove Call-Count Survey (CCS) and the Roadside Dove Survey (RDS). The CCS is a national survey conducted annually in cooperation with the states and the USFWS. The CCS was established in 1966, and currently contains ≥1,000 survey routes nationally. The CCS was established to provide regional and national population indices. In Missouri, the CCS index is the average number of doves heard calling per mile along #20 standard routes. The RDS is an independent survey conducted annually by Department staff; the survey contains usable data going back to 1948. The RDS provides an index of doves seen, rather than calling, along standardized routes throughout the state (Jackson, St. Louis, and St. Charles counties excluded). The RDS provides regional data for Missouri that the CCS cannot supply. There is very strong long-term relationship between both surveys; however, the two surveys may show opposite trends within a given year.

For Missouri, CCS route regression analysis between 2002 and 2003 showed a nonsignificant ($P > 0.1$) increase of 28.5% (90% CI −4.9% to 61.8%; Fig. 6). During the last 10-years (1994-03), Missouri's CCS dove trend data showed a significant ($P < 0.01$) decrease of 6.3% (90% CI −8.3% to −4.2%) per year. Long-term trends from Missouri's CCS data continued to show a significant ($P < 0.01$) decline of 2.2% (90% CI −3.4% to −1.0%) per year from 1966-2003. Throughout the 14 Central Management Unit (CMU; Fig. 4) states, 2003 dove populations showed a nonsignificant ($P > 0.1$) increase of 2.7% (90% CI −2.8% to 8.1%) compared to 2002 population indices.

Statewide results of the 2003 RDS showed 1.35 doves/mile; an 3.9% increase compared to 2002 (Fig. 6), a 1.5% increase from the statewide 5-year average (1998-02; 1.33 doves/mile, SD 0.14), and a 5.5% increase from the statewide 10-year average (1993-02; 1.28 doves/mile, SD 0.14; Table 1). Regionally (Fig. 1), Mississippi Lowlands had the highest index (3.00 doves/mile) and the Ozark Plateau the lowest (0.58 doves/mile; Table 1).

Both CCS and RDS data show slight increases (Fig. 6), indicating similar to slightly higher population levels compared to previous years. Depending upon weather conditions the last week of August and early September and food availability to concentrate doves, hunting opportunities are anticipated to be good.

LONG-TERM POPULATION TRENDS

Long-term mourning dove trends from both RDS and CCS surveys provide an interesting picture (Fig. 6). Since 1966, both surveys show a strong relationship (r = 0.76; 1966-2002); a stronger relationship exists for the RDS and the North American Breeding Bird Survey (BBS) index of mourning doves (r = 0.89; 1966-1996). If we assume that these 2 (or 3) surveys are tracking similar aspects of the mourning dove population, we see 3 things from Figure 6. First, we see that although trends have declined since 1966, the trend has been relatively stable in the last 10 years. Second, we see that although trends are lower today than during the late 1960s, RDS trends are near levels similar to the late 1940s and early 1950s. Third, we see that some phenomena occurred during the late 1950s and early 1960s that caused trends to climb rapidly. Regionally, we can speculate that some beneficial and broad scale land use changes occurred in the Mississippi Lowlands, Northeast Riverbreaks, Northeastern Riverbreaks, and Western Prairie during the late 1950s and early 1960s (Fig. 7-14).

From a national perspective, some controversy exists about the relative merits of the BBS and CCS surveys, and the ability of the surveys to track changes in mourning dove population trends. Although the CCS protocol is specifically designed for doves, the number of survey routes is less compared to the BBS, which leads to concerns about the sensitivity of the survey to detect trends. In addition, these trend declines may not be indicative of actual changes in populations, but rather an index to unmated males in the breeding season, changes in habitat along standardized survey routes, or other factors.

MONITORING DOVE SHOOTING FIELD MANAGEMENT

Mourning doves can provide abundant hunting opportunities close to where urban residents live. Unlike other game animals that require relatively large areas of habitat for hunting, dove shooting field management can routinely occur on sunflower fields ranging in size from 5 to 30 acres. However, considerable uncertainty exists concerning mourning dove harvest management strategies; e.g., half day vs. all day hunting, large daily harvests in relatively short periods vs. small daily harvests spread out over a longer interval.

To address this set of management questions, biologists from 6 conservations areas with active dove shooting management programs met in July, 2000 to develop a long-term Adaptive Resource Management (ARM) process. The ARM process works best with management problems such as this one because the problem is small enough to explicitly define and develop a meaningful monitoring program. Thus, the overall goal of the ARM program is learn how different dove management strategies impact our objective of maximizing dove hunting opportunities on the 6 areas (August A. Busch CA, Bois D'Arc CA, Columbia Bottom CA, Eagle Bluffs CA, Pony Express CA, James A. Reed Memorial Wildlife Area). To monitor our success in meeting our objective, we are measuring the number of hunters, hours hunted, doves killed, and shots fired on each of the 6 areas (Table 2). This coming season, the monitoring program will expanded to 13 conservation areas around Missouri. As a part of the monitoring program, dove hunters on these 13 areas will be required to report the number of doves killed, shots fired, and hours hunted.

MOURNING DOVE RESEARCH UPDATE

National Pilot Banding Study

To improve future harvest management decisions at the national, regional, and statewide levels, population information is needed to make better informed decisions. New population models are being constructed using existing historical data to help make more informed harvest management strategies and to illustrate which pieces of new population information are most critical. Efforts are also underway to initiate a pilot banding program in 28 states (Fig. 15) to obtain band reporting rates and harvest rates for use in the population models, which in turn will be used making decisions about future changes in hunting regulations. To date, these efforts have received wide spread support (e.g., flyway technical committees, flyway councils, joint flyway councils, IAFWA subcommittees and working groups). Missouri has selected 11 banding stations (Table 3), and trapping will be completed before the season opener.

Pilot Wing Collection Surveys

In conjunction with the national pilot dove banding study and the population modeling effort, the Department will also conduct a pilot evaluation of obtaining recruitment estimates from samples of wings collected from hunter-killed doves. We plan to again collect wings from 6 areas in 2003; James A. Reed Memorial Wildlife Area, Pony Express CA, Bois D'Arc CA, Eagle Bluffs CA, Otter Slough CA, A. A. Busch CA. Wings will also be collected concurrent with the banding study to determine if actual estimates of recruitment can be obtained, compared to relative trends.

Long-term Localized Banding Study
Given the increasing popularity of dove hunting near urban areas, local dove harvests and associated intensity of managing sunflower fields have increased substantially on numerous conservation areas. Managers and biologists, however, have limited knowledge of how these locally intensive harvests effect populations. For example, what subpopulations or subgroups of mourning doves are harvested on these areas; locally established populations or different migratory subpopulations passing through the area? What are some plausible explanations for observed annual fluctuations in year-to-year harvests on these managed areas?

Using a collaborative effort between research and management staff to address these issues, a long-term banding study (≥10-years) was initiated in 2000 at the James A. Reed Memorial Wildlife Area. Trapping annually occurs during the summer (July 1 – August 21) and winter (January 1 – February 28); 1,000 doves are the target sample size for each trapping session. Summer dove trapping has been accomplished with few problems; 1999 (a pilot year) 513 birds were trapped and banded, 1004 doves in 2000, and 818 doves in 2001. Winter trapping, however, continues to be problematic; to date no birds have been trapped in the winter on the study site due to various reasons. It will be several years before any meaningful conclusions can be made.

West Nile Virus Monitoring
In conjunction with the previously described long-term mourning dove banding study at the J. A. Reed Memorial Wildlife Area, we have been monitoring the seasonal presence of the West Nile virus. Because numerous other bird species are often captured while trapping mourning doves, we have the opportunity to monitor the presence of the virus in a range of bird populations throughout the year. Oral swabs have been collected by ≥1300 birds and 1100 those samples have been analyzed. To date, 7 samples have tested positive for the presence of the virus; 2 from red-winged blackbirds and 5 from mourning doves. Mosquito sampling has also been conducted since early June. For more detailed information about human health concerns and other monitoring effects go to:

http://www.dhss.state.mo.us/WestNileVirus/index.html

http://www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm

Trichomoniasis Study Update
Given the heightened interest in improving the mourning dove harvest management decision making process, an improved understanding is needed of the various natural mortality mechanisms; e.g., diseases and parasites. Trichomoniasis has widely been acknowledge as natural mortality factor, however, little information is available concerning population effects and explanations for year-to-year fluctuations in the presence of the disease.

Trichomonas gallinae is a pear-shaped flagellated protozoan which sometimes causes a fatal disease called trichomoniasis in mourning doves, other columbids, and some raptors. The disease is thought to be transmitted when infected adult doves feed nestlings, and/or contaminate drinking water and food sources (i.e., bird feeders or baths) used by other doves. Weather conditions may contribute to disease transmission; e.g., extended hot dry weather may force birds to use limited but contaminated food and water supplies. Trichomonads are usually found in the oral-nasal cavity, or anterior end of the digestive and respiratory tracts of infected birds. Symptoms include difficulty flying, listlessness, swollen necks, and cheesy yellowish lesions in the oral cavity. The infected individual dies when the lesions block the trachea and oral cavity making eating and respiration impossible. Our objectives are to determine the presence of *Trichomonas gallinae* in a local mourning dove population using hunter killed birds on the James A. Reed Memorial Wildlife Area (JARMWA), Missouri, 1998-2002, and to evaluate the practicality of a large scale *Trichomonas gallinae* monitoring program to monitor trends in the disease's presence through time. Our goal is to attempt to sample 1,000 hunter-killed birds annually using the InPouch7 TF (BioMed Diagnostics, San Jose, CA, USA) culture system for detecting trichomonads. Using 3 captive mourning doves from another study, which died from trichomoniasis, we tested how long trichomonads lived in the dead birds. Viable trichomonads were found >36 hrs after the birds died and were left at ambient temperature showing that hunter-killed birds would prove useful in detecting the presence of the parasite.

During 1 September 1998, we tested 687 hunter-killed doves from JARMWA; an additional 29 doves were sampled from Eagle Bluff Conservation Area during the first and third days of the hunting season to increase our sample size. Of the 716 birds sampled, none showed visible lesions but 39 (5.4%) tested positive for carrying the parasite. During 1 September 1999, we tested 541 hunter-killed birds from JARMWA. Of the 541 birds sampled, no birds showed visible lesions but 30 (5.5%) tested positive for carrying the parasite. During 1 September 2000, we tested only 415 hunter-killed doves from JARMWA; we sampled fewer birds because of extremely hot weather on opening day of the dove season and corresponding low hunter participation. None of the 415 birds showed visible lesions; however, 10.6% of the birds tested positive for carrying the parasite. On 4 September 2001, we tested 823 hunter-killed mourning doves from JARMWA. None displayed visible lesions, and 4.4% of the birds tested positive for carrying the parasite. We are currently uncertain about the population impacts of these infection rates. Given the relatively low cost of this study, we are considering continuing the monitoring of hunter-killed doves beyond 2002. A longer term monitoring program would provide more insights into annual variation in the presence of the disease, and more certainty concerning factors that relate to causes of the annual variation.

Funding and assistance for this study was provided by 1998 Webless Migratory Game Bird Research Program (U.S. Fish and Wildlife Service and the U.S. Geological Survey-Biological Resources Division), Missouri Department of Conservation-Conservation Research Center (Federal Aid in Wildlife Restoration Project W-13-R-52), and BioMed Diagnostics (San Jose, CA).

Subcutaneous Transmitter Implant Study Update

The use of radio telemetry as a wildlife research tool has broadened our understanding of many ecological processes. A critical assumption of telemetry studies, however, is that transmitters have no appreciable effects on animals, and provide unbiased estimates of the variables being studied. Despite the widespread application of radio telemetry, the impacts of radiotransmitters on animals have been subjectively evaluated; e.g., the animal's behavior appeared unaffected or reproduction seemed normal. A common approach has been to assume that the radiotransmitter package has minimal effects if the animal successfully completes the biological or behavioral processes such as mating or producing offspring. Such reasoning is weak, however, indicating only that the transmitter packages are not overtly deleterious to the well-being of the animals in question.

Despite the success of previous mourning dove investigations using dorsally attached radiotransmitters with cyanoacrylate-based glues, the attachment of radiotransmitters is relatively short term; i.e., 2-12 weeks. In addition to short retention time, prolonged exposure of the skin to the glue could potentially cause pathological tissue damage of a physical nature. Other dove investigators have used either double body loop or double wing loop harnesses because these harness attachment methods securely held the transmitters to the sample of marked birds; it was not unusual for some birds to retain transmitters for ≥12 months. Although harnesses provide an effective long-term attachment method, numerous problems have been reported in other avian species (e.g., reduction in survival or sublethal effects on behavior, body mass, feathers, skin).

Because mourning dove transmitter glue attachment is a relatively short-term attachment technique, and transmitter harnesses have been shown to inflict deleterious injuries, other methods of attaching transmitters have been developed and tested. A study conducted in Missouri (Schulz et al. 1998) showed that subcutaneously implanted radiotransmitters had minor physiological or pathological effects on captive mourning doves compared to doves with intra-abdominal radiotransmitter implants. Based on the success of previous work, Schulz et al. (2001) conducted a second evaluation that used captive wild mourning doves to compare the physiological effects of subcutaneous transmitter implants to radiotransmitters attached with glues and harnesses. The data suggested that subcutaneous implants were superior to glue attachments based on retention time, and superior to harnesses based on pathological effects. Subcutaneous implants did not appear to affect doves physiologically in a captive setting, although long-term effects on wild free-flying doves were unknown.

Before implanted transmitters can be recommended as a standard field technique for radio telemetry, however, further evaluation has been recommended (Schulz et al. 1998, Schulz et al. 2001) to evaluate the efficacy of the subcutaneous implant technique in a wide range of situations and conditions. Also, these previous studies were conducted using relatively small cages which limited the movements of the birds, and possibly biasing the results in regards to effects on free-flying birds. Other questions concerning optimum post-surgical recovery times, post-surgical release protocols, surgical site complications, and post-treatment effects need to be evaluated in more natural conditions where captive wild birds are allowed to fly and conduct daily activities while still following experimental protocols. Therefore, the objectives of this project are to evaluate the efficacy of using fecal corticosterone levels as an independent measure of stress, and then evaluate the physiological stress and pathological effects related to captive wild mourning doves implanted with subcutaneous radiotransmitters using larger cages. In addition to fecal corticosterone, other measurement variables include heterophil:lymphocyte ratios, blood plasma chemistries, body weights during pretreatment and post-treatment sessions, body temperature of doves implanted with thermistor transmitters, and pathology/histopathology data from necropsies.

The field portion of the study has been completed with the majority of the analysis to follow. The final report and associated manuscripts should be completed prior to June 2004. Funding for this study was provided by 2001 Webless Migratory Game Bird Research Program (U.S. Fish and Wildlife Service and the U.S. Geological Survey-Biological Resources Division), Missouri Department of Conservation-Conservation Research Center (Federal Aid in Wildlife Restoration Project W-13-R-56), University of Missouri (Department of Fisheries and Wildlife Sciences; Veterinary Medical Teaching Hospital; Veterinary Diagnostic Laboratory), and Advanced Telemetry Systems (Isanti, Minnesota).

Pb shot Evaluation and Proposed Research

Mourning dove hunting is becoming increasingly popular, especially hunting over managed shooting fields. Given the possible increase in lead (Pb) shot availability on these conservation areas, our objectives were to estimate availability and ingestion of spent shot at the Eagle Bluffs Conservation Area (EBCA; hunted with non-toxic shot) and the James A. Reed Memorial Wildlife Area (JARWA; hunted with Pb shot) in Missouri. During 1998, we collected soil samples one or 2 weeks prior to the hunting season (prehunt) and after 4 days of dove hunting (posthunt). We also collected information on number of doves harvested, number of shots fired, shotgun gauge, and shotshell size used.

Dove carcasses were collected on both areas during 1998-99. At EBCA, 60 hunters deposited an estimated 64,775 pellets/ha of non-toxic shot on or around the managed field. At JARWA, approximately 1,086,275 pellets/ha of Pb shot were deposited by 728 hunters. Our posthunt estimates of spent shot availability from soil sampling were 0 pellets/ha for EBCA and 6,342 pellets/ha for JARWA. Our findings suggest that existing soil sampling protocols may not provide accurate estimates of spent shot availability in managed dove shooting fields. During 1998-99, 15 of 310 (4.8%) mourning doves collected from EBCA had ingested non-toxic shot. For doves that ingested shot, 6 (40.0%) contained ≥7 shot pellets. In comparison, only 2 of 574 (0.3%) doves collected from JARWA had ingested Pb shot.

Because a greater proportion of doves ingested multiple steel pellets compared to Pb pellets, we suggest that doves feeding in fields hunted with Pb shot may succumb to acute Pb toxicosis and thus become unavailable to harvest, resulting in an underestimate of ingestion rates. Although further research is needed to test this hypothesis, our findings may partially explain why previous studies have shown few doves with ingested Pb shot despite feeding on areas with high Pb shot availability. Four follow-up research projects have been suggested that will provide more reliable information for possible changes in dove hunting regulations. The projects include investigations exploring effects of acute and chronic Pb toxicosis, shot selection by doves according to shot type and size, relationships among nutritional regimes/temperature/toxicology, and field evaluations of non-toxic shot regulations. Full details of this investigation are available in the **Wildlife Society Bulletin 2002, 30(1): 112-120**.

Table 1. Percent change of the 2003 Roadside Mourning Dove Survey relative to 2002, 5-year (1998 – 02), and 10-year (1993 – 02) averages.

Zoogeographic Regions	2003 Index[a]	2-Year (2002 – 03) % Change	5-Year (1998 – 02) % Change	10-Year (1993 – 02) % Change
Northwest Prairie (12)[b]	1.78	12.7	6.4	13.1
Northern Riverbreaks (11)	1.40	-14.3	6.9	10.4
Northeast Riverbreaks (20)	1.34	-6.3	9.1	6.9
Western Prairie (12)	1.83	19.7	-2.2	-1.4
Western Ozark Border (13)	1.40	2.6	-7.2	-7.4
Ozark Plateau (23)	0.58	26.2	-2.1	8.3
Northern and Eastern Ozark Border (12)	0.92	-16.6	-14.1	-16.0
Mississippi Lowlands (7)	3.00	31.5	10.0	32.0
STATEWIDE (110)	1.35	3.9	1.5	5.5

[a]Survey index is equal to the number of mourning doves observed per mile.
[b]Number of counties within zoogeographic region with a completed and returned survey route.

Table 2. Dove harvest characteristics during September 2002 from 6 conservation areas cooperating with an Adaptive Resource Management (ARM) program to evaluate the effects of different hunter management strategies on the goal of maximizing hunting opportunities.

Area	Doves Killed	Shots Fired	Hours Hunted	No. Hunters
A. A. Busch CA	1556	8453	1870.0	1209
Bois D'Arc CA	1853	11594	1944.25	691
Columbia Bottom CA[1]	(no hunt in 2002)	*	*	*
Eagle Bluffs CA	530	2002	*[2]	195
Pony Express CA	5013	31688	3394.7	1105
J. A. Reed Mem. WA	1178	4879	1323.15	692
TOTAL	10130	58616	8532.1	3892

[1]No dove hunt on Columbia Bottom CA due to area construction.
[2]Hours hunted not recorded

Table 3. Conservation areas participating in the national pilot mourning dove banding study according to latitude/longitude degree block (see Fig. 16 for degree block map).

Degree Block No.	Selected Conservation Areas	Preliminary Band Quota
1	Nodaway Valley	50
	Bilby Ranch	50
3	Lake Paho	100
7	Pony Express	100
8	Fountain Grove	100
12	Settle's Ford	100
14	Eagle Bluff	100
15	Prairie Fork	100
16	Columbia Bottom	100
18	Bois D'Arc	50
	Talbot	50
20	White River Trace	100
27	Otter Slough	100
28	Ten Mile Pond	100

Figure 1. Zoogeographic regions of Missouri.

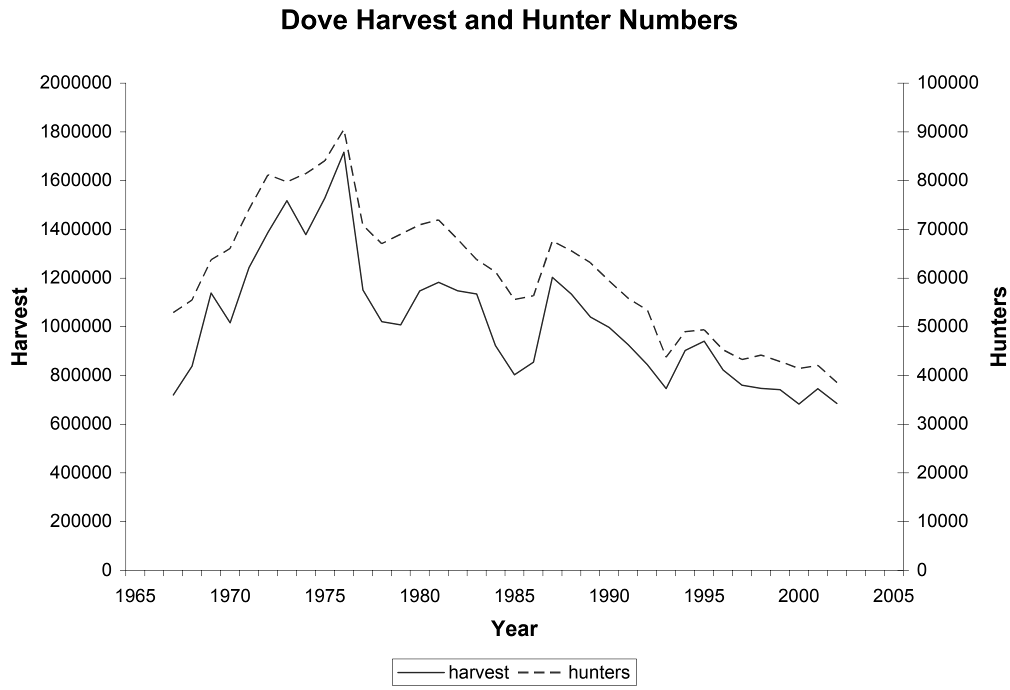

Figure 2. Long-term trends (1967 – 02) of mourning dove harvest and number of dove hunters in Missouri.

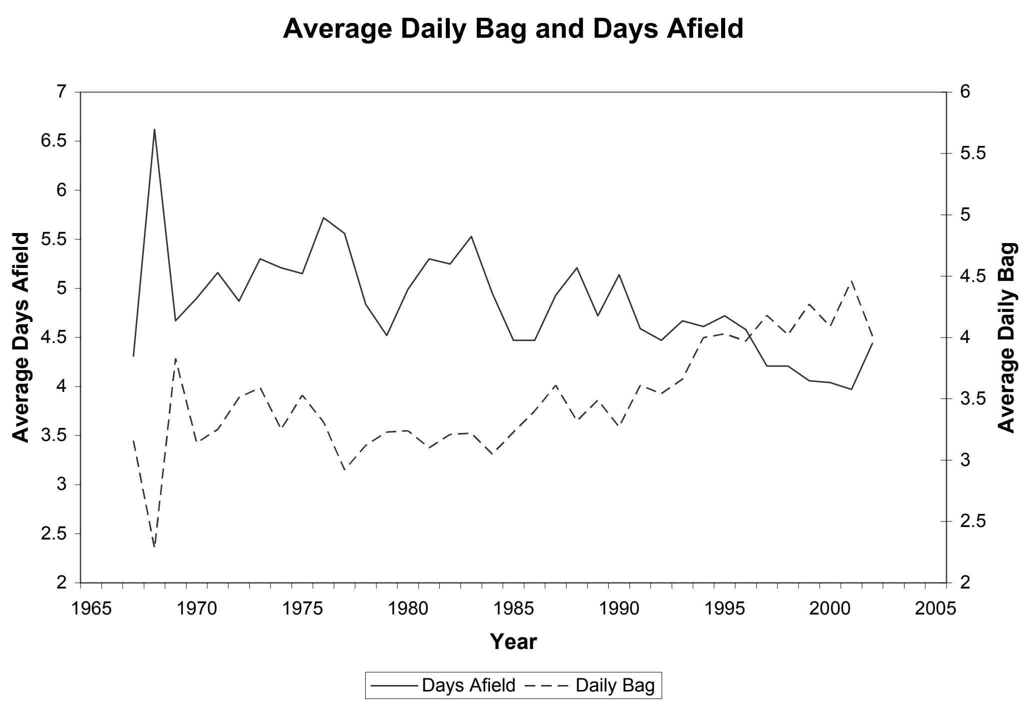

Figure 3. Long-term trends (1967– 02) of mourning dove average daily bag limit and average number of days afield for Missouri dove hunters.

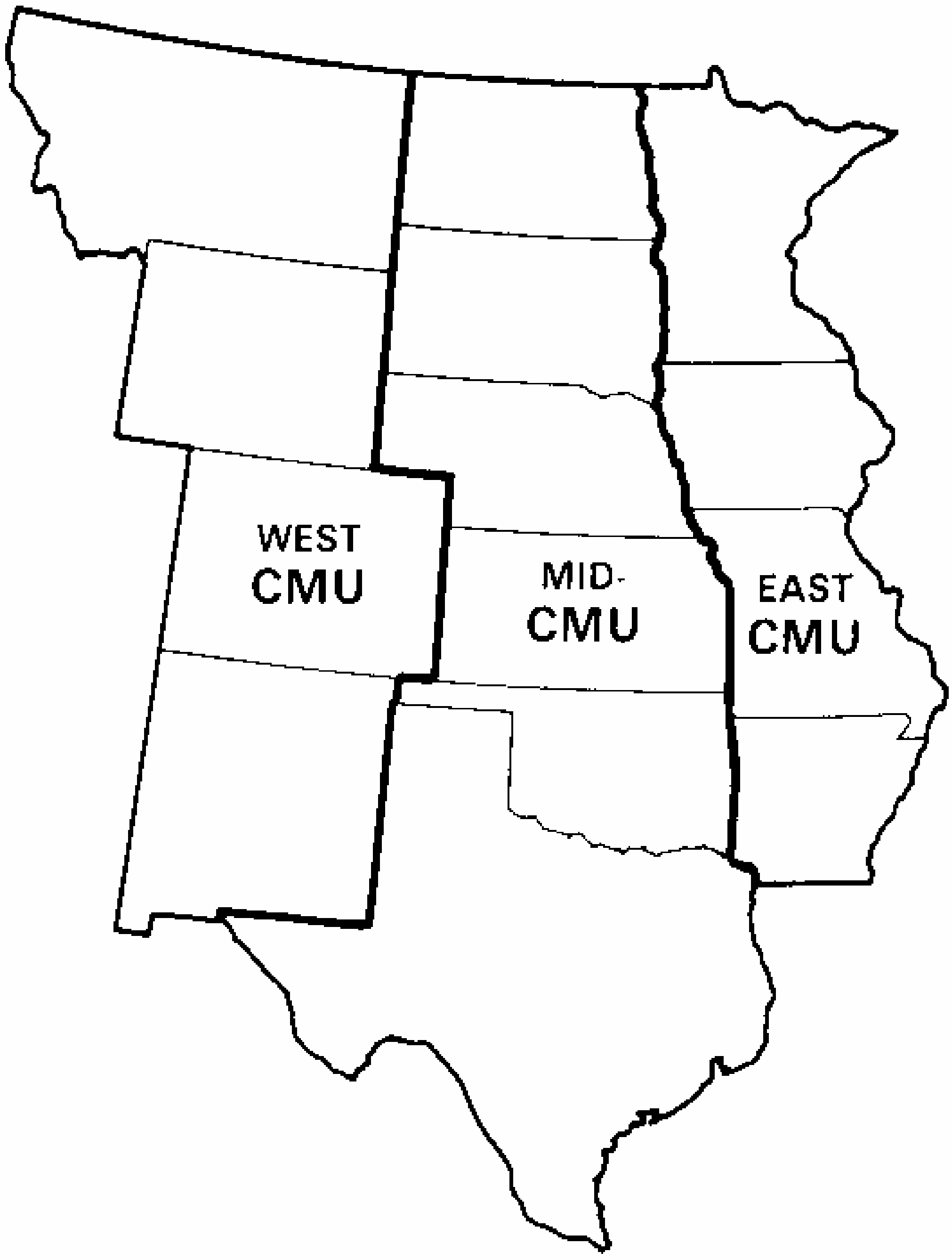

Figure 4. Central Management Unit (CMU) states and subunits used in managing mourning dove harvest.

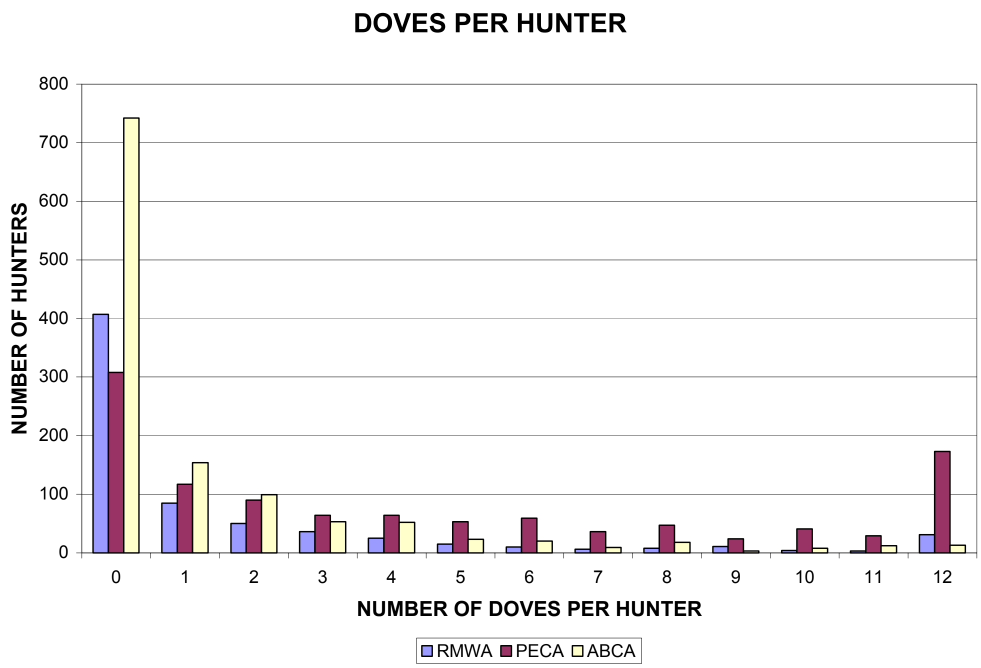

Figure 5. Distribution of mourning dove bag by number of hunters on the Pony Express CA, A. A. Busch CA, and J. A. Reed Memorial Wildlife Area during September, 2002.

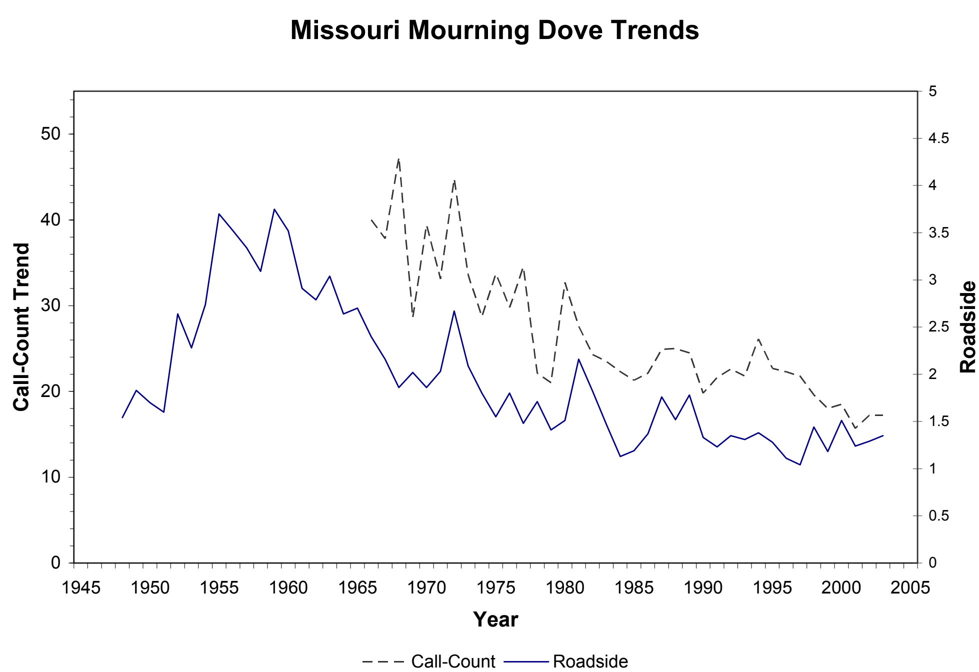

Figure 6. Missouri roadside mourning dove survey (RDS) expressed as doves/mile (1948 - 2003) and U.S. Fish and Wildlife Service mourning dove call-count survey (CCS) route regression trend analysis (1966-2003).

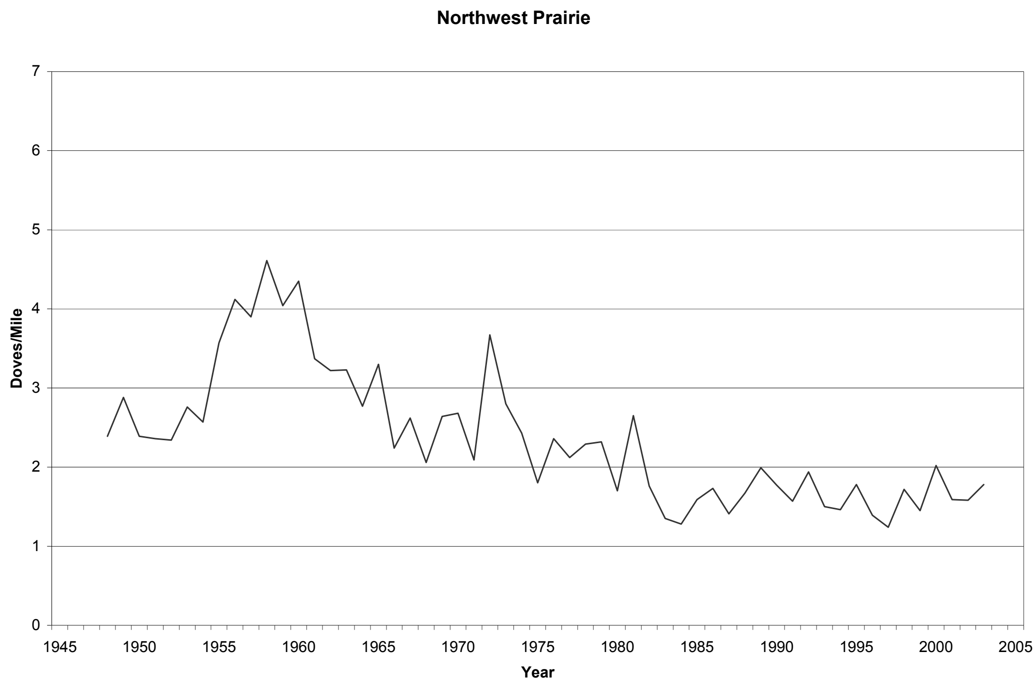

Figure 7. Northwest Prairie long-term trends.

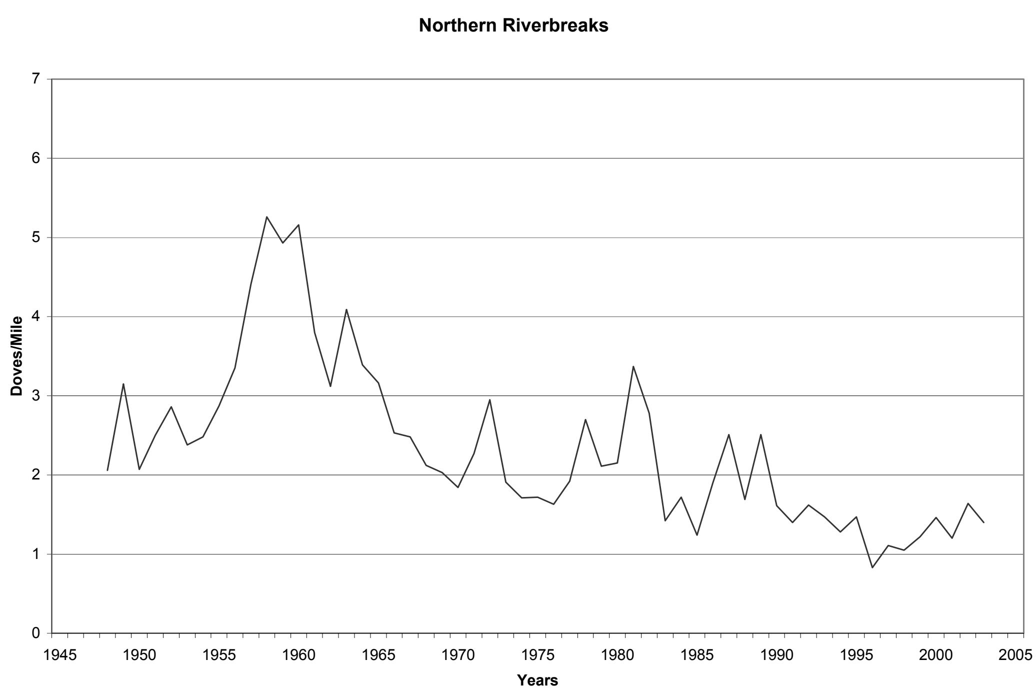

Figure 8. Northern Riverbreaks long-term trends.

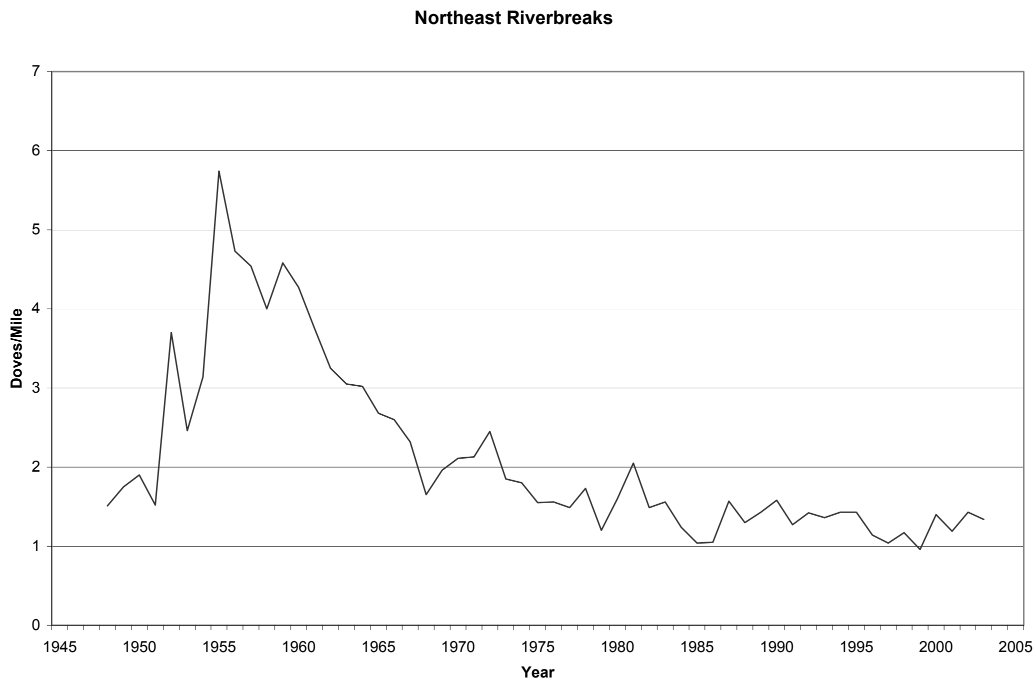

Figure 9. Northeast Riverbreaks long-term trends.

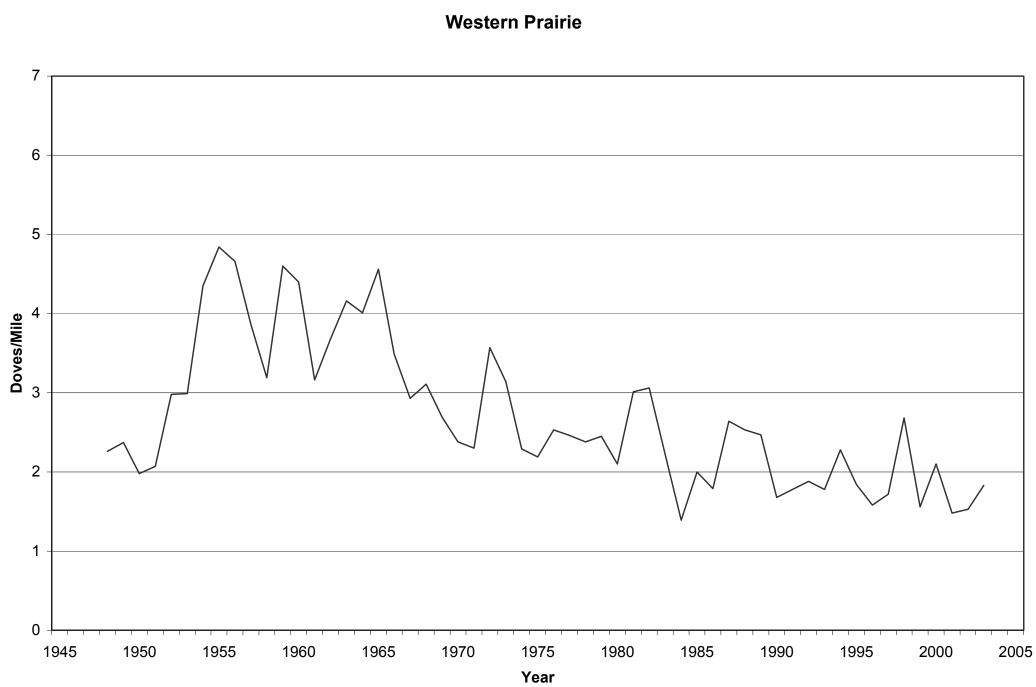

Figure 10. Western Prairie long-term trends.

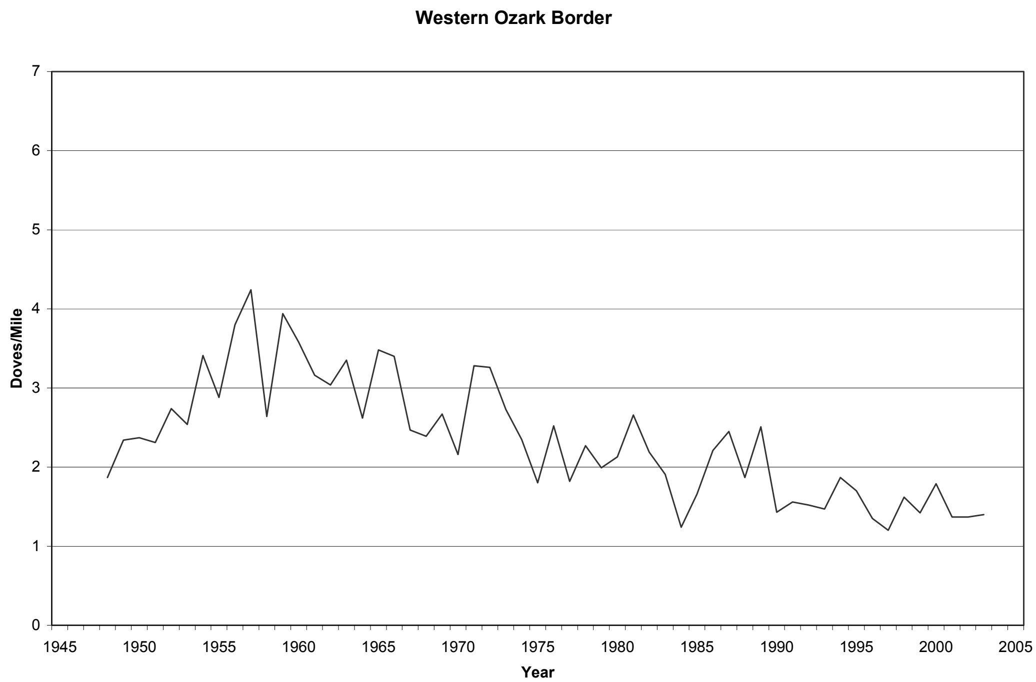

Figure 11. Western Ozark Border long-term trends.

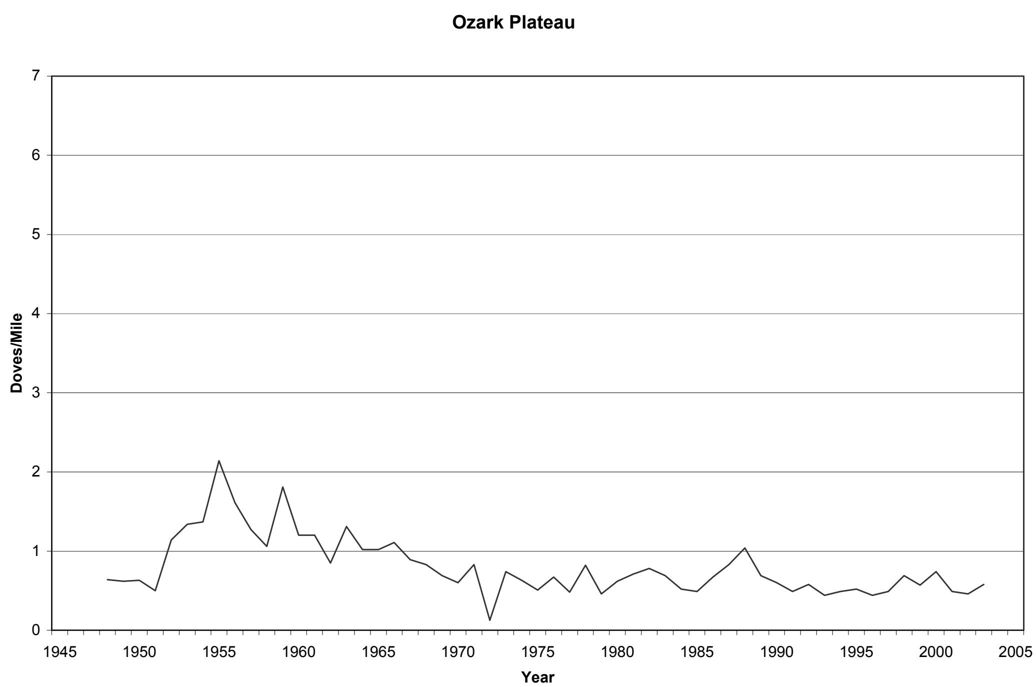

Figure 12. Ozark Plateau long-term trends.

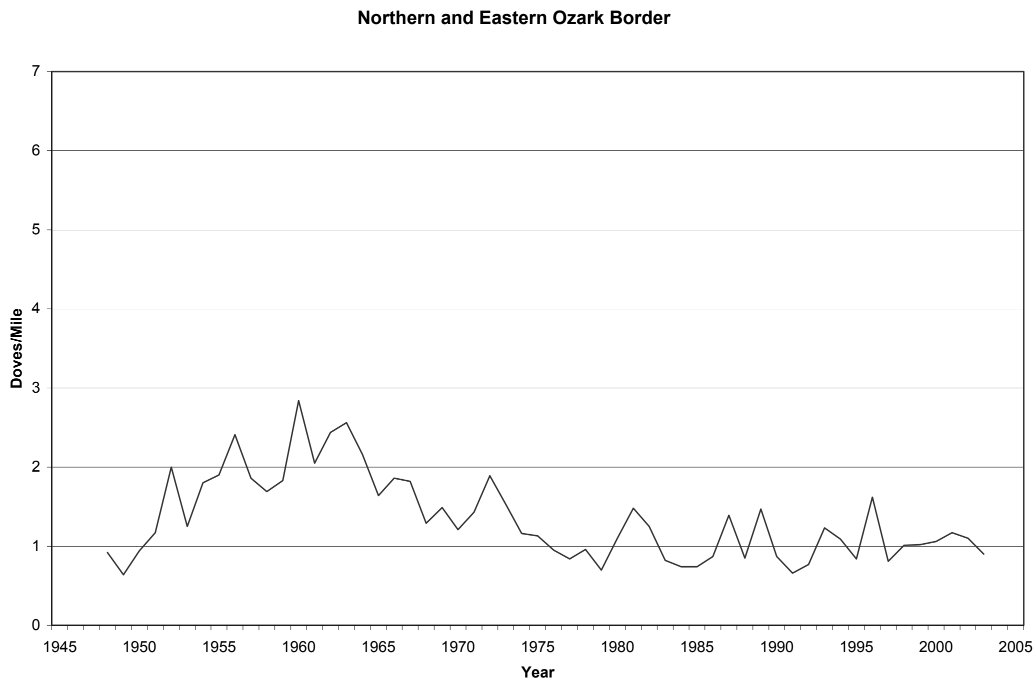

Figure 13. Northern and Eastern Ozark Border long-term trends.

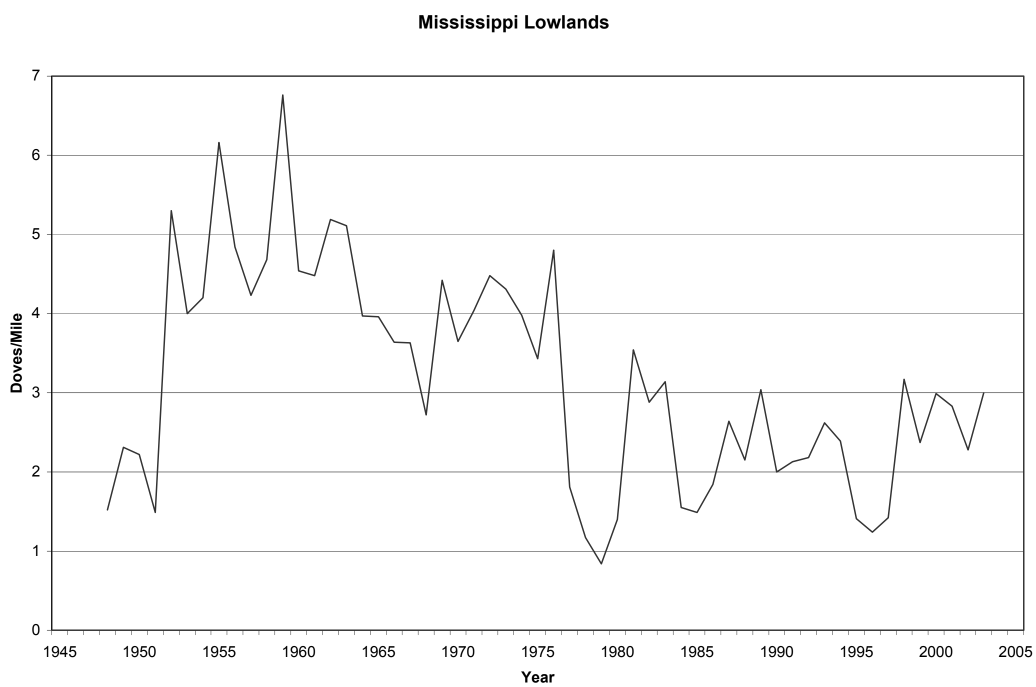

Figure 14. Mississippi Lowlands long-term trends.

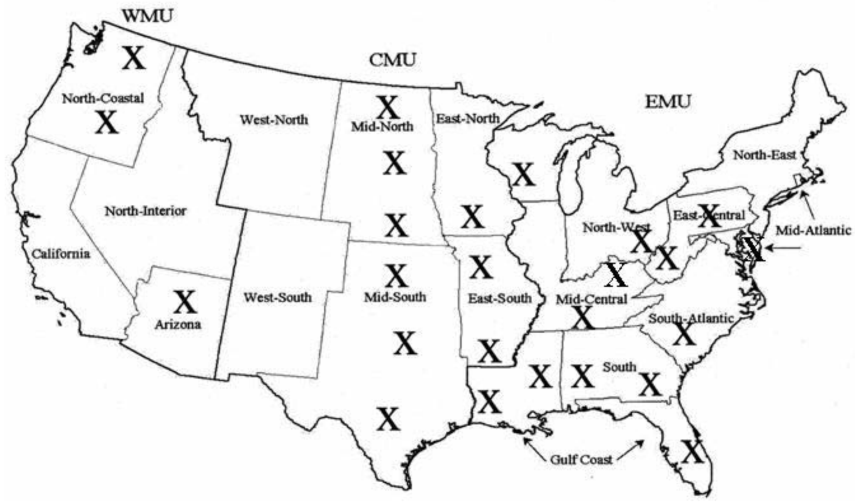

Figure 15. Mourning dove management units (Eastern, Central, and Western) divided into subunits based upon reanalysis of historical banding data; states within subunits that are participating in the national pilot banding study are marked with X.

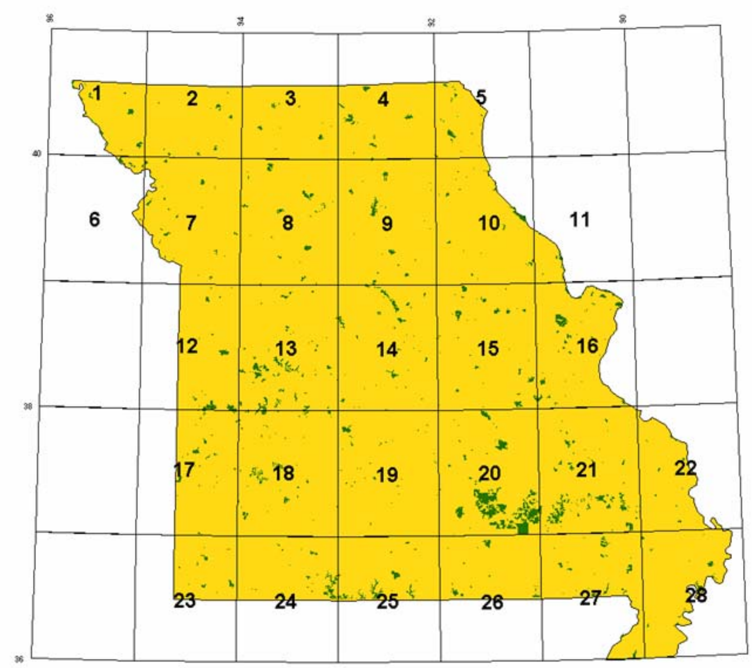

Figure 16. Map of latitude/longitude degree block used to assigned trapping/banding stations for the national mourning dove pilot banding study; dark areas represent Missouri Department of Conservation public lands.